

Appl. No. 10/807,208  
Amdt. dated March 29, 2005  
Reply to Office Action of December 29, 2004

PATENT

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for direct-conversion of a modulated radio-frequency (RF) signal, comprising:  
receiving an RF signal; and  
mixing the RF signal with a plurality of oscillator signals with different phases in an interleaving manner to produce a plurality of baseband signals, each or the plurality of baseband signals including interleaved in-phase and quadrature baseband signals.
2. (Original) The method as recited in claim 1, wherein the RF signal is converted to a differential RF signal.
3. (Original) The method as recited in claim 1, wherein the oscillator signals include an oscillator signal frequency substantially equal to an RF signal frequency of the RF signal.
4. (Original) The method as recited in claim 1, wherein the RF signal is modulated over a finite bandwidth.
5. (Currently Amended) The method as recited in claim 1, wherein the oscillator signals have phase differences of ~~45, 135, 225 and 315~~ 0, 90, 180, and 270 degrees.
6. (Original) The method as recited in claim 1, wherein the mixing is carried out by a plurality of mixers.
7. (Original) The method as recited in claim 6, wherein the oscillator signals are input to the mixers in the interleaving manner.
8. (Original) The method as recited in claim 7, wherein the oscillator signals are input to the mixers in the interleaving manner by switching which oscillator signals are input to which mixers.
9. (Original) The method as recited in claim 8, wherein the switching occurs at a rate that is faster than a bandwidth of the RF signal.

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10. (Original) The method as recited in claim 8, wherein the switching occurs in a substantially random manner.

11. (Original) The method as recited in claim 10, wherein the switching occurs in a random manner.

12. (Currently Amended) The method as recited in claim 1, wherein a modulation of the RF signal is reconstructed as a baseband signal using a de-interleaving operation applied to the plurality of baseband signals.

13. (Original) The method as recited in claim 12, wherein an in-phase baseband signal and a quadrature baseband signal is generated by the reconstruction.

14. (Original) The method as recited in claim 12, wherein the de-interleaving operation includes inverting and routing operations.

15. (Original) The method as recited in claim 13, wherein low-pass filtering is applied to the in-phase baseband signal and the quadrature baseband signal.

16. (Original) The method as recited in claim 15, wherein a direct current (DC) offset of the in-phase baseband signal and the quadrature baseband signal is removed.

17. (Original) The method as recited in claim 15, wherein an amplitude distortion and a phase distortion of the in-phase baseband signal and the quadrature baseband signal are equated.

18. (Currently Amended) A direct-conversion subsystem, comprising:  
means for receiving an RF signal; and  
means for mixing the RF signal with a plurality of oscillator signals with different phases in an interleaving manner to produce a plurality of baseband signals, each or the plurality of baseband signals including interleaved in-phase and quadrature baseband signals.

19. (Canceled)

20. (Canceled)

21. (Currently Amended) A method for direct-conversion of a modulated signal, comprising:  
receiving a signal; and

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mixing the signal with a plurality of oscillator signals with different phases in an interleaving manner to produce a plurality of baseband signals, each or the plurality of baseband signals including interleaved in-phase and quadrature baseband signals.

22. (New) A direct-conversion subsystem, comprising:  
a first mixer configured to receive an RF signal;  
a second mixer configured to receive the RF signal;  
a Local Oscillator (LO) configured to generate an oscillator signal;  
a polyphase network coupled to the LO and configured to generate a plurality of LO signals at different phases relative to the oscillator signal; and  
an LO phase interleaver configured to selectively couple each of the plurality of LO signals to the first and second mixers in an interleaving manner to generate baseband signals at the output of the first mixer and the second mixer, the baseband signals including interleaved in-phase and quadrature baseband signals based on the interleaving manner.